Remarks:

In the Office Action mailed on September 1, 2006, the Examiner rejected Claims 1-27. No claims are amended, cancelled or added herein. Claims 1-27 are pending in the application.

35 USC 103

Claims 1-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner (US Patent 5,387,907) in view of Humboldt (WO 01/49001). Applicants traverse the rejection.

The Examiner has failed to establish a prima facie case of obviousness.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. ... Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP 2143. The Examiner has failed to meet this burden. "If examination at the initial stage does not produce a prima facie case of unpatentability, then without more the appellant is entitled to grant of the patent." In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992), *quoted in* In re Lowry, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994).

Gardner teaches a telemetry system in which data rate is improved through a particular modulation scheme. Gardner observes the generally-known phenomenon that signal attenuation is a function of the conditions encountered, in particular, that there is increased attenuation at the higher temperatures encountered at higher depths (e.g., Figure 5). Gardner explains that "the present disclosure is intended to cooperate with a cable having the attenuation characteristics represented by the curve 20" (Figure 5) (Col. 7, lines 63-65). To address the difficulties that are associated with the attenuation typically encountered, Gardner proposes a modulation scheme that deals with the expected signal distortion (Col. 5, lines 16-17).

Gardner's scheme involves encoding a 16-state symbol in a 49 point constellation, scrambling, use of NRZ binary data, etc. Gardner asserts that "Distortion is therefore reduced to enable this type transmission and the related bandwidth efficiency" (Col. 5, lines 20-22). Thus, Gardner addresses how to transmit data in a manner to alleviate the problems associated with attenuation on the logging cable.

Humboldt, similarly, provides for transmission of logging data on a wireline cable in an oil well. In the case of Humboldt, data transmission is performed over multiple carrier frequencies. Humboldt describes the difficulties in successfully transmitting data on multiple carrier frequencies in the harsh environments found in petroleum wells, e.g., high temperatures, pressure, and long cables. Humboldt teaches several techniques for training the system to work well in the particular conditions encountered and to dynamically adjust the transmission parameters during the course of a logging job, e.g., the distribution of the transmission data over the multiple carriers according to SNR encountered on each carrier. Thus, Humboldt, like Gardner is directed to specific telemetry techniques used *during* a logging job.

In contrast, to Gardner and Humboldt, the present invention deals with steps performed prior to commencing a logging job. In particular, the invention is directed to a solution that avoids the expense and time-delay associated with encountering that a tool string requires a data rate that the cable cannot support. Prior to starting the logging job, the data rate is predicted as a function of the operational parameters that is likely to be encountered during the logging job. That predicted data rate is compared to the required data rate of the tools that are to be used in the logging job. If the predicted data rate exceeds the required rate, corrective action may be

taken. Thus, avoiding the undesirable result of having to take that corrective action during the course of the logging job.

Claim 1 recites "A wireline logging method, comprising ... before inserting the wireline cable into a well bore, modeling a down hole value of the operating characteristic and deriving a down hole data rate capacity based thereon", Claim 12 recites "a modeler enabled to predict the down hole value of the operating characteristic when the wireline cable is inserted into the well bore", and Claim 21 recites "a computer-readable medium having ... computer code means for estimating a data rate capacity of the wireline cable based on the modeled down hole value." Neither Gardner nor Humboldt teach or suggest these limitations.

The Examiner has asserted that "Gardner teaches the estimation of the data rate of the cable and determining the optimum frequency" (Office Action, Section 3, lines 8-9). Applicants disagree with this reading of Gardner. On the contrary, Gardner specifically states that "the transfer function of the cable is variable, both with time and with temperature and *is variable in a fashion not readily known*, the distortion is both variable and unknown so that it must be dealt with dynamically where system parameters are not known in advance" (Gardner, Col. 4, lines 63-67, emphasis added). Thus, it would be unlikely that a person reading Gardner would arrive at the concept of "modeling a down hole value of the operating characteristic and deriving a down hole data rate capacity based thereon" (Claim 1) and the similar limitations from Claims 12 and 21.

Humboldt similarly does not teach or suggest "modeling a down hole value of the operating characteristic and deriving a down hole data rate capacity based thereon" (or the similar limitations from Claims 12 and 21). Humboldt is directed to a system for transmitting logging data on a wireline using multi-tone modulation. While there are several adjustments made

during the course of a logging job, e.g., adjusting bits-per-carrier in response to SNR observed on individual carriers, and adjusting overall power or power-per-carrier in response to SNR, Humboldt does not teach or suggest doing modeling prior to insertion of the logging instruments into the well.

Claim 1 further recites "upon determining that the estimated data rate requirement does not match the down hole data rate capacity, modifying the tool string." Both Gardner and Humboldt disclose systems for transmitting data during logging jobs. The Examiner has correctly observed that "Gardner does not teach the modification of the tool string of the data rate of (sic) the data rate of the cable does not match the downhole rate of the cable" (Office Action, Section 3, Lines 10-11).

The Examiner makes the statement "Once the downhole rate of the cable has been determined, the tool string is altered so that the data rate does not exceed the rate of the cable". However, the Examiner has not provided a reference for that statement. The assertion is not to be found in either Gardner or Humboldt. Therefore, Applicants respectfully submit that there is no prior art cited by the Examiner providing support for the Examiner's assertion. Accordingly, Applicants posit that this element is not taught by the prior art.

As neither reference discuss estimating the data rate prior to commencing the logging job, it is not surprising that the references fail to teach or suggest carrying out an adjustment to the tool string in response to performing the logging job.

Claim 12 recites "means for indicating when a data rate corresponding to the predicted down hole value of the operating characteristic is not matched to a data rate required by the tool string" and "for comparing the estimated data rate capacity to the determined data rate requirement and indicating when the estimated data rate capacity and the determined data

rate requirement are mismatched." As discussed herein above, both references deal with data transmission during logging jobs and neither propose estimating the data rate prior to commencing a logging job. Therefore, it is not surprising that neither reference teach or suggest indicating that the predicted data rate does not match the required data rate because both reference do not provide the necessary predicate for having that data available to serve as basis for such an indication.

Accordingly, Claims 1, 12, and 21 recite limitations that are not found in either Gardner or Humboldt. Therefore, because a *prima facie* case of obviousness requires, at least, that "the prior art reference (or references when combined) must teach or suggest all the claim limitations," a *prima facie* case of obviousness has not been presented. For these reasons, Applicants respectfully request withdrawal of the rejection and allowance of the claims.

Claims 2-11, 13-20, and 22-27 depend from Claims 1, 12, and 21, respectively, inherit all the limitations of these claims, recite further unique and non-obvious combinations, and are patentable for, the reasons given in support of Claims 1, 12, and 21 and by virtue of such further combinations.

CONCLUSION

It is submitted that all of the claims now in the application are allowable. Applicants respectfully request consideration of the application and claims and its early allowance. If the Examiner believes that the prosecution of the application would be facilitated by a telephonic interview, Applicants invite the Examiner to contact the undersigned at the number given below.

Applicants respectfully request that a timely Notice of Allowance be issued in this application.

Respectfully submitted,

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